UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/040,885	01/02/2002	Hannu Mikkola	944-003.060-1	8876

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EXAMINER
KERVEROS, JAMES C

ART UNIT	PAPER NUMBER
2133	

DATE MAILED: 09/08/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>02 January 2002</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-34</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-34</u> is/are rejected.

7)☒ Claim(s) <u>1-34</u> is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>02 January 2002</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>4/15, 9/4/2002</u>

4)☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION0

1.   Claims 1-36 are pending and are hereby presented for examination, in response

to the present Application filed 1/2/2001.

Specification

2.   The abstract of the disclosure is objected to because it does not comply with a

proper language and format for an abstract of the disclosure. The abstract should be in

narrative form and it should avoid using form and legal phraseology often used in patent

claims, such as "The method includes: a step" on line 4, "puncturing; and a step" on line

11. Also, the numerals in parenthesis should be deleted to comfort to U.S. practices.

Correction is required. See MPEP § 608.01(b).

Claim Objections

3.   Claims 1-34 are objected to because of the following informalities:

The numeral designations enclosed in parenthesis, used throughout the claims,

should be deleted because the do not carry patentable weight. Appropriate correction is

required.

Claim Rejections - 35 USC § 102

4.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a
foreign country or in public use or on sale in this country, more than one year
prior to the date of application for patent in the United States.

Claims 1-6, 9-14, 16-22, 25-30 and 32 are rejected under 35 U.S.C. 102(b) as being anticipated by Huang et al. (US 5511096).

Regarding independent Claims 1, 17, Huang discloses a method and a transmitting apparatus (FIG. 1) for decoding a sequence of bits encoded for transmission to a symbol error correcting coder 12, such as a Reed-Solomon encoder, which converts the information into a block 14 ("RS Codeword"), including a plurality N of successive n-bit coded symbols 16, where n=7, where M represent the actual information to be communicated and the remaining N-M parity symbols include error correcting redundancy, comprising:

Means (Reed-Solomon encoder, 12, FIG. 1) for providing a plurality N of successive n-bit coded symbols 16, using a convolutional encoder (48) which employs a punctured rate 4/5, 16-state trellis code, in which the generators are 25 and 37 in octal.

Means (mapper 50) for mapping the five bits output from encoder 48 for each four bits input and the ten uncoded bits as labels which map to five three-bit symbols for transmission. The equivalent of two seven-bit Reed-Solomon symbols (fourteen bits total) are transmitted as five three-bit, sixty-four QAM symbols.

Regarding independent Claims 2, 18, Huang discloses a method and a receiving apparatus (FIG. 1) for decoding a sequence of bits encoded for transmission to a symbol error correcting coder 12, such as a Reed-Solomon encoder, which converts the information into a block 14 ("RS Codeword"), including a plurality N of successive n-bit coded symbols 16, where n=7, where M represent the actual information to be

communicated and the remaining N-M parity symbols include error correcting

redundancy, the transmitting method and apparatus comprising:

Means decoder 32 for demapping the symbols, which is input to a deinterleaver

34 that strips out the control symbols and reverses the effects of interleaver 18. The

deinterleaved data is input to a Reed-Solomon decoder 36 for recovery of the original

information bits. FIG. 3 illustrates an implementation of the sixty-four QAM trellis

decoder 32. For each five bits output on line 66 to a rate 4/5 16-state Viterbi decoder

68, four decoded bits are provided at the output of the Viterbi decoder. The conditional

determinations of the uncoded bits are output on line 64. The Viterbi decoder 68 can

be a rate 1/2 decoder that is punctured to rate 4/5, which is well known puncture

techniques.

Regarding Claims 3, 5, 7, 19, 21, 23, Huang discloses means (interleaver 18,

FIG. 1) for interleaving the symbols between coding operations. The intent of the

interleaving is to break up the bursts of symbol errors, and wherein the means (mapper

50) for mapping is operative after (interleaver 18). "The symbols in each block are

interleaved for transmission in an interleaved order to minimize the effects of burst

errors when recovering the input signal after transmission (see, Summary of the

Invention).

Regarding Claims 9, 10, 25, 26, Huang discloses convolutional encoder (48),

which employs a punctured rate 4/5, 16-state trellis code, where interleaved blocks are

convolutionally encoded using an inner trellis code having a punctured rate 4/5 (see,

Abstract).

Regarding Claims 11, 27, Huang discloses means (Reed-Solomon encoder, 12, FIG. 1) for providing a plurality of sequences of bits using a convolutional encoder (48), including means for puncturing one of the sequences of bits, using an outer symbol error correcting code which is concatenated with a punctured multidimensional trellis code to provide an optimal scheme for communicating digital television signals in a standard bandwidth channel via a cable television network or the like, (see, Abstract).

Regarding Claims 13, 29, Huang discloses means (interleaver 18, FIG. 1) for interleaving.

Regarding Claims 14, 30, Huang discloses means (interleaver 18, FIG. 1) for interleaving performs bit interleaving, wherein the means (mapper 50) for mapping is operative after the means (18) for interleaving, FIGS. 1 and 2.

Regarding Claims 15, 31, Huang discloses means (interleaver 18, FIG.1) for interleaving the symbols between coding operations.

Regarding Claims 12, 16, 32, Huang discloses means for puncturing, such as convolutional encoder (48), which employs a punctured rate 4/5, 16-state trellis code.

Regarding Claims 4, 6, 20, 22, Huang discloses means (34, FIG. 1) for deinterleaving, which is bit deinterleaving, wherein the means (32) for demapping is performed before the deinterleaver 34, FIGS. 1 and 3.

Regarding Claim 28, Huang discloses means Viterbi decoder 68 for providing output bits, which is a rate 1/2 decoder that is punctured to rate 4/5 using well known puncture techniques. For each five bits output on line 66 to a rate 4/5 16-state Viterbi decoder 68, four decoded bits are provided at the output of the Viterbi decoder.

Claim Rejections - 35 USC § 103

5.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed
> or described as set forth in section 102 of this title, if the differences between the
> subject matter sought to be patented and the prior art are such that the subject
> matter as a whole would have been obvious at the time the invention was made
> to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was
> made.

Claims 7, 8, 15, 23, 24, 31, 33 and 34 are rejected under 35 U.S.C. 103(a) as

being unpatentable over Huang et al. (US 5511096).

Regarding Claims 7, 15, 23, 31, Huang does not explicitly disclose the limitation

of "wherein the means for providing a mapping is operative before the means for

interleaving". However, Huang already provides means (interleaver 18, FIG. 1) for

interleaving before means (mapper 50) for mapping. It would have been obvious to a

person having ordinary skill in the art at the time the invention was made to rearrange

the transmitting apparatus of Huang by performing mapping before interleaving, since

the over all output function of the transmitting apparatus is the same regardless of the

arrangement.

Regarding Claims 8, 24, Huang substantially discloses means (34) for

deinterleaving performs symbol deinterleaving. Huang does not explicitly disclose the

limitation of "wherein the means for demapping is operative after the means for

deinterleaving. However, Huang already provides means (deinterleaver 34, FIG. 1) for

deinterleaving after means (32) for demapping. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to rearrange the receiving apparatus of Huang by performing demapping after deinterleaving, since the over all output function of the receiving apparatus is the same regardless of the arrangement.

Regarding Claims 33, 34, Huang does not explicitly disclose a system for wireless communication, including a base station and a mobile station, wherein either the base station or the mobile station includes a transmitting apparatus and wherein either the base station or the mobile station includes a receiving apparatus. However, Huang a method and apparatus for use with a communication system, including a transmitting and receiving apparatus (FIG. 1). Furthermore, it is well known in the art of the mobile communication to include a trans receiver in a mobile device, such as a cellular telephone. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to use a transmitting and receiving device, as taught by Huang, in a mobile station, such as a cellular telephone. A person of ordinary skill in the art would have been motivated to incorporate a trans receiver in a mobile device, which is well known in the art of the mobile communication system, since a trans receiver is required for proper operation of the mobile device.

Conclusion

6.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Chen et al. (US 6347122) discloses a communication system configured to utilize complementary-punctured convolutional codes, FIG. 2, including a transmitter 22 and a receiver 24. The transmitter 22 includes an audio coder 25 signal applied to a convolutional encoder 26 for encoding bit stream into a sequence of symbols, which are interleaved in an interleaver 27, and then applied to a modulator 28, where the modulated carrier is transmitted via transmit antenna 29 to the receiver 24 include a deinterleaver 32 and a decoder 33 using a soft Viterbi decoding process, where the digital bit stream is then decoded in audio decoder 34 to reconstruct the original audio signal.

7.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to James C Kerveros whose telephone number is (703) 305-1081. The examiner can normally be reached on 9:00 AM TO 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert Decady can be reached on (703) 305-9595. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.
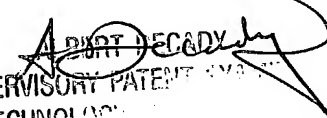
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U.S. PATENT OFFICE
Examiner's Fax: (703) 746-4461
Email: james.kerveros@uspto.gov

By: _____

Date: 25 August 2004

Office Action: Non-Final Rejection

James C Kerveros
Examiner
Art Unit 2133

SUPERVISORY PATENT EXAMINER
TECHNOLOGY